

# Power Distribution

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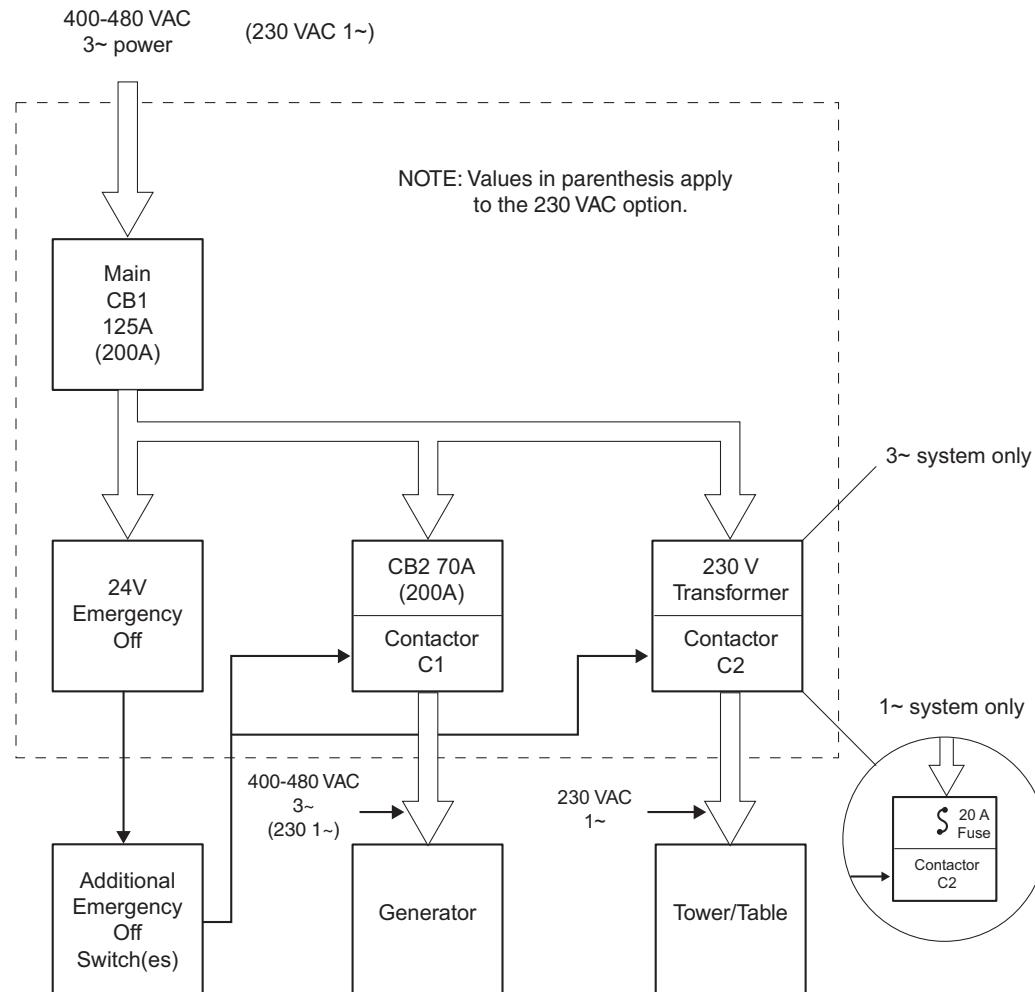
# Circuit/Mechanical Descriptions

## Facility Power Distribution

**Note:** *The following description applies specifically to the GE OEC facility power distribution junction box. If the customer did not choose that option, the following information does not apply.*

The following figure represents incoming power from the hospital or other facility. A wall-mounted junction box contains a main circuit breaker (CB1), with a separate circuit breaker (CB2) for generator. The transformer is fuse protected on both the primary (F4) and secondary (F5). Two separate contactors for the generator (C1) and tower/table (C2) control the power through the emergency off circuitry also built into the box. The emergency off circuitry energizes the coils of the generator and tower/table contactors, and provides for distributed additional switches that will interrupt the power to the coils, shutting off all power to the Uroview 2800.

## Power Distribution

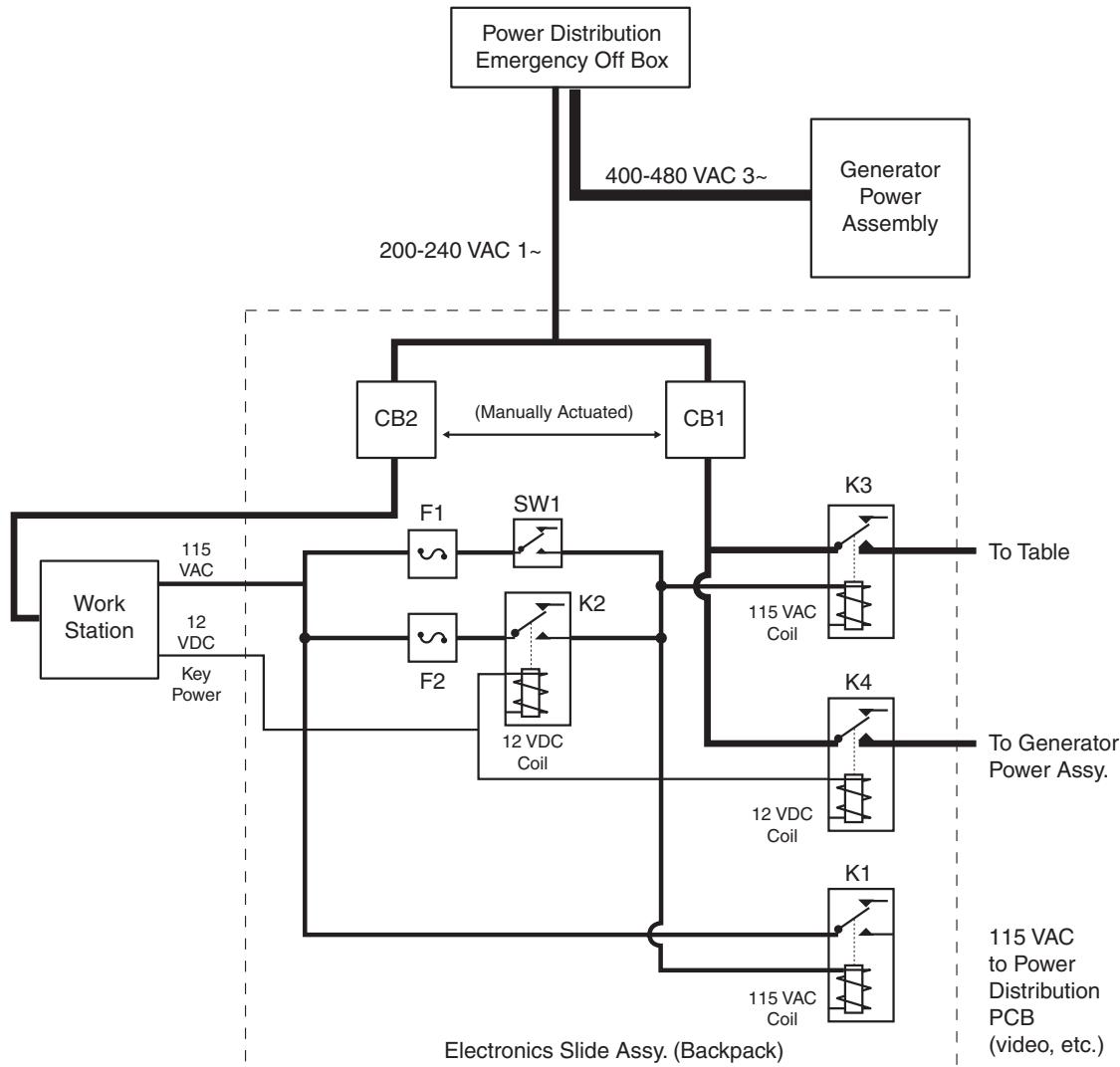


**GE OEC Facility Power Distribution**

## **Tower/Table AC Power Control**

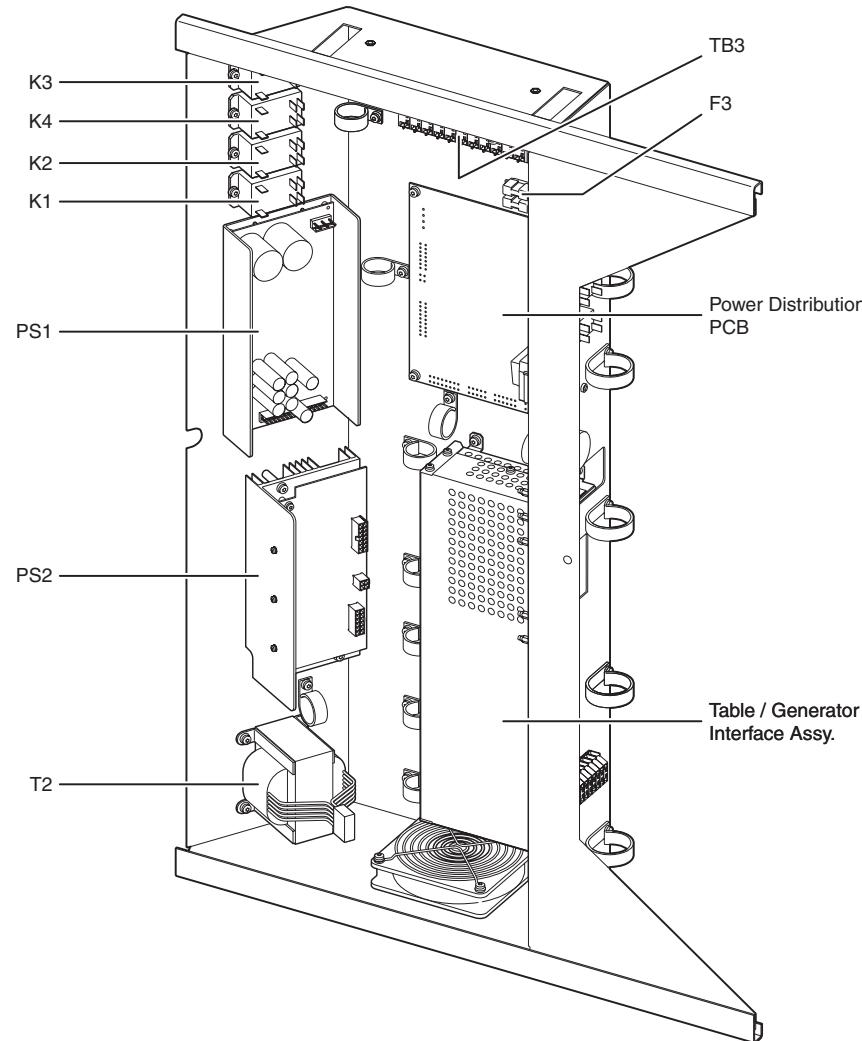
The following figure represents distribution of AC power in the Tower/Table. With main power engaged at the facility junction box, CB1 and CB2, located inside the Electronics Slide Assembly (Backpack) control incoming 200-240 VAC for further distribution. The figure after that shows the physical location of the AC power handling components.

## Power Distribution



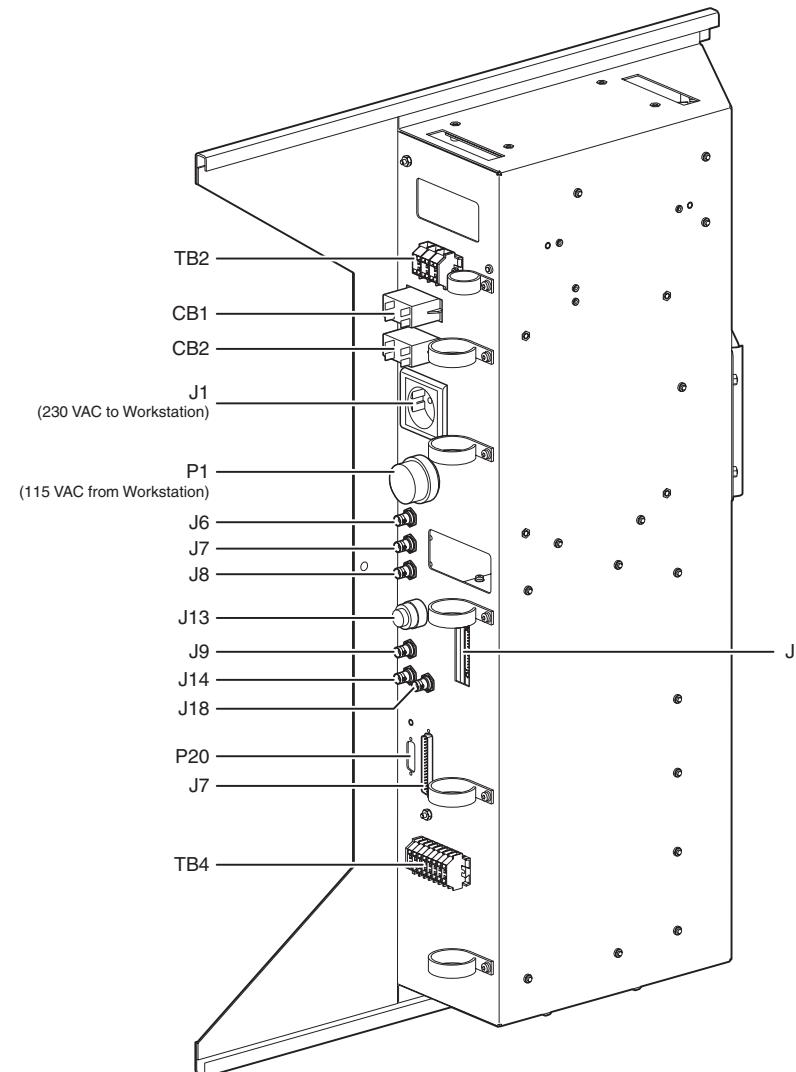
**Table/Tower AC Distribution**

## Power Distribution



**Electronics Slide Assembly (Backpack) Components**

## Power Distribution

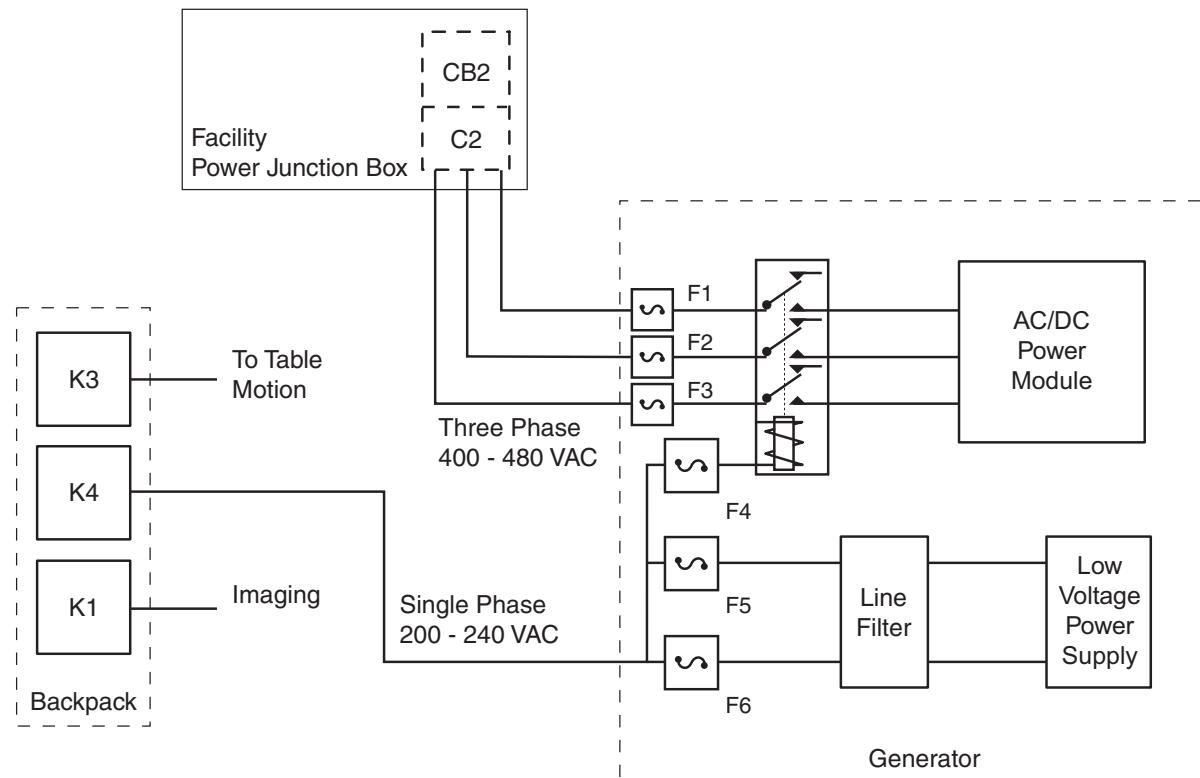


**Electronics Slide Assembly (Backpack) Components (Continued)**

## Generator Power Distribution

For 3-phase systems (see diagram below, *Generator Power Distribution*), 400-480 VAC connects directly from the facility power junction box to the generator, with 200-240 VAC single-phase entering the generator via the workstation and backpack.

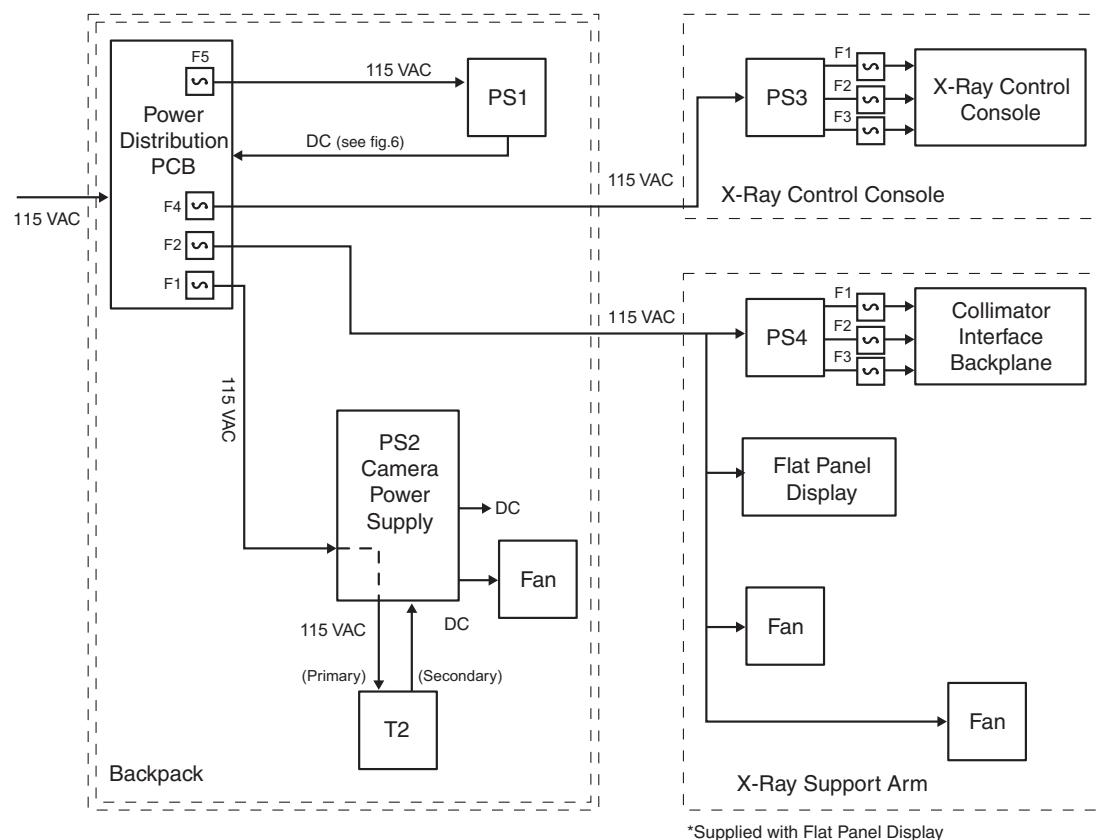
For single-phase systems, the facility power junction box distributes 230 VAC directly to the generator, and also via the backpack to the generator.



**Generator Power Distribution**

## 115 VAC Power Distribution

From the workstation (connected to CB2 in the backpack as previously shown), 115 VAC connects via relay K1 to the Power Distribution PCB, also located in the backpack. The following diagram shows how it distributes 115 VAC.

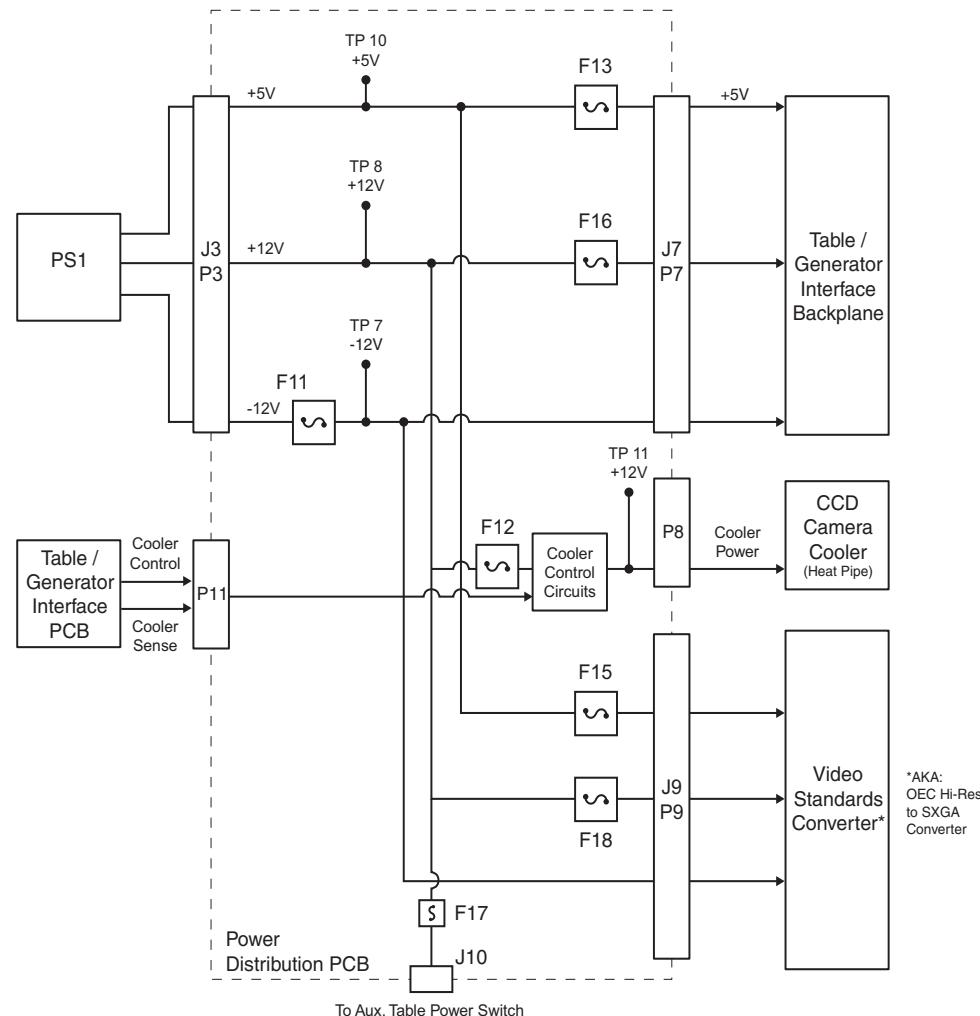


**115 VAC Power Distribution**

## **PS1 DC Output**

PS1, located in the backpack, receives 115 VAC from the Power Distribution PCB, and returns +5, +12, and -12 VDC. Testpoints and fuses on each leg let you monitor each output (see the following figure). One of the +12 VDC outputs and a control signal from the Table/Generator Interface PCB join with onboard circuitry for the CCD Camera Cooler.

## Power Distribution



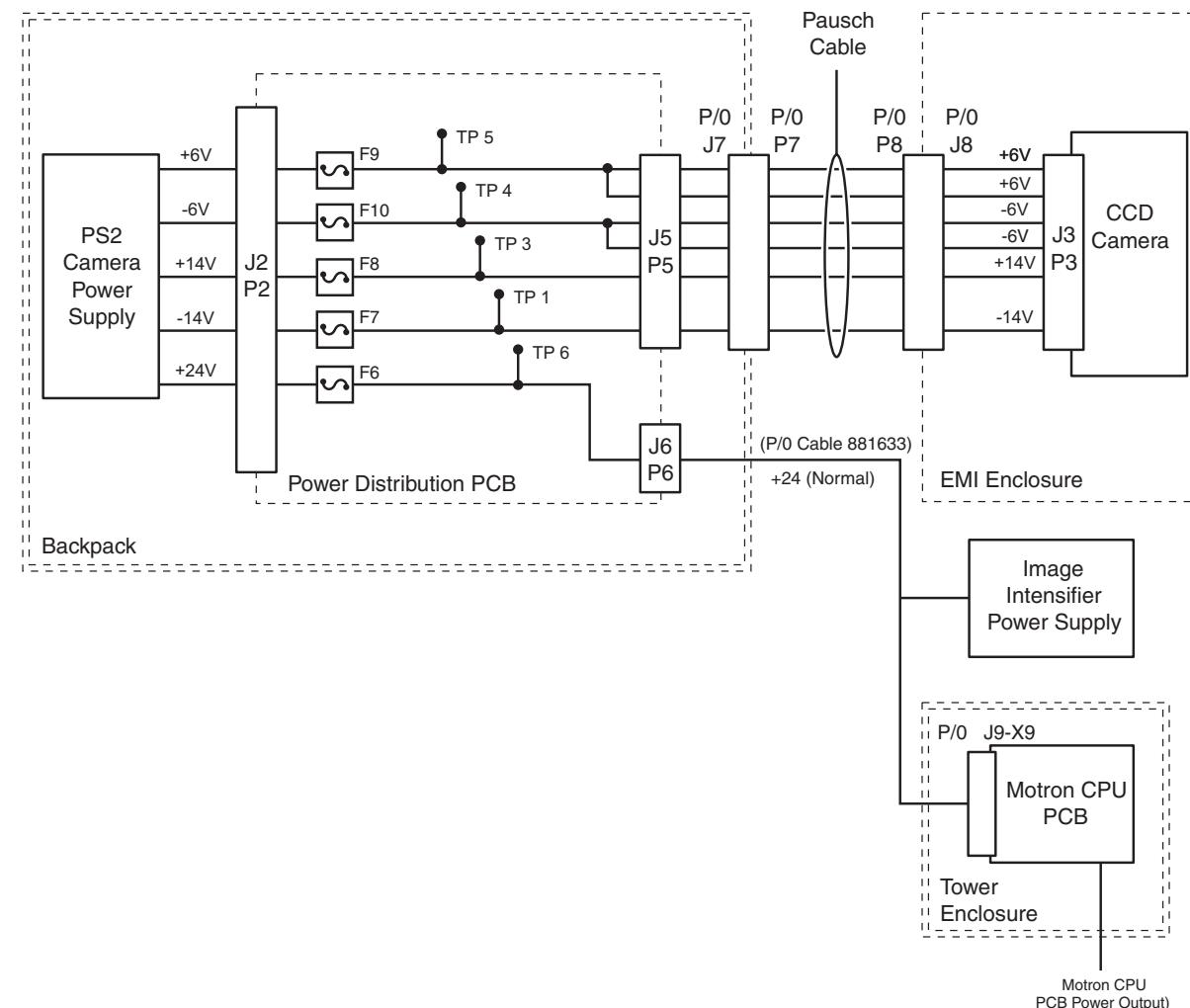
**PS1 DC Output**

## **PS2 DC Output**

PS2, located in the backpack, receives 115 VAC from the Power Distribution PCB, and returns +6, -6, +14, -14, and +24 VDC. Testpoints and fuses on each leg let you monitor each output (see the next figure). At backpack connector J7, a proprietary cable provided with the table carries all the DC power except the +24 VDC from PS2 to the CCD Camera.

From backpack connector J6, the +24 VDC connects to the Motron CPU PCB (functionally, the generic name is Table Motion CPU, but is more commonly referred to by its manufacturer name throughout the Uroview 2800 system technical drawings). By the way, do not confuse this +24 VDC with an entirely separate +24VDC voltage output by the Motron CPU PCB, called the Motron +24V.

## Power Distribution



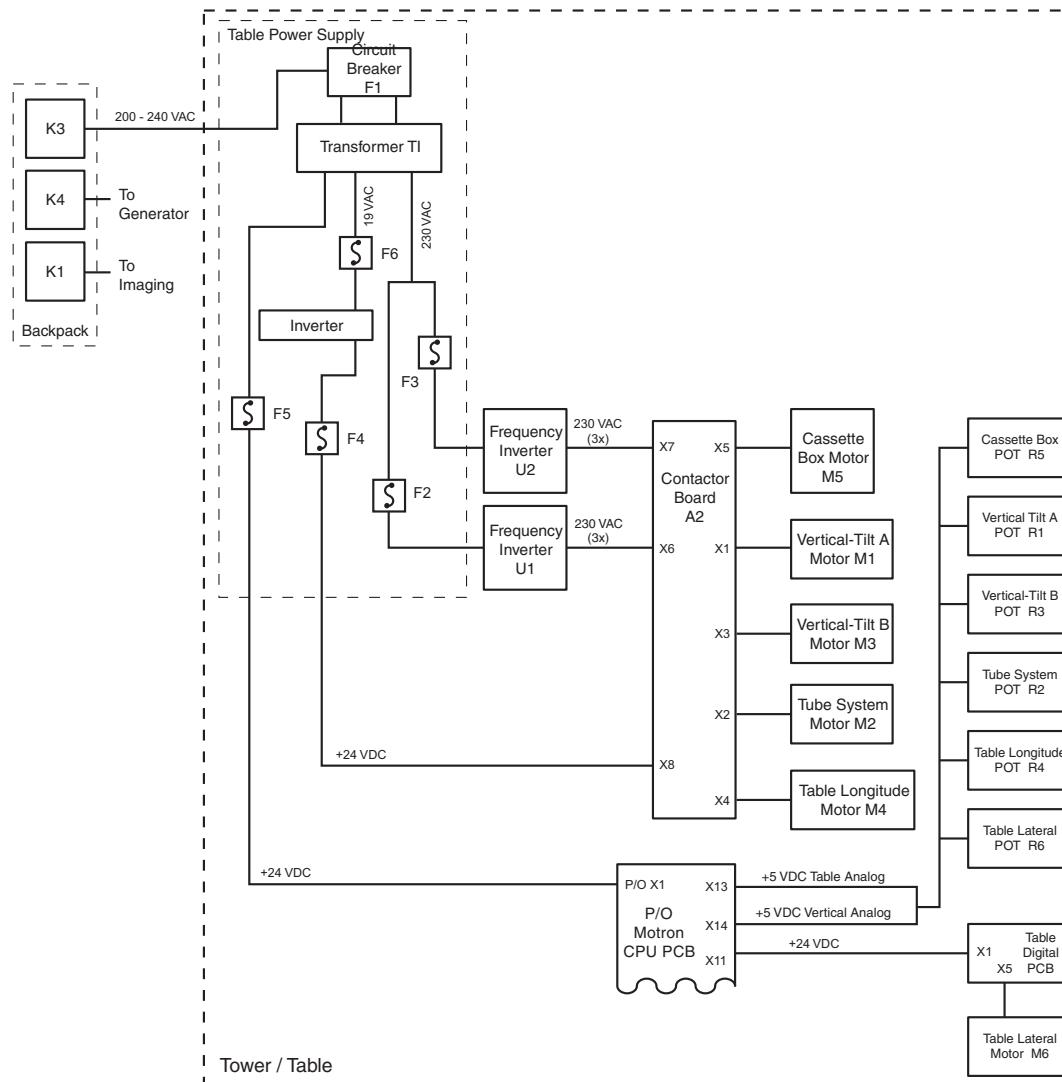
## PS2 DC Output

## **Table Motion Power Distribution**

In the backpack, CB1 controls input 200-240 VAC single-phase power via relay K3 to the table, as shown previously. For an overview of power distribution for the table, refer to the following figure.

Transformer tap strapping in the Table Power Supply was set up when the system was installed. If the transformer is later replaced or disconnected for other reasons, be sure the strapping is correctly done (see *Adjustments*, later in this chapter).

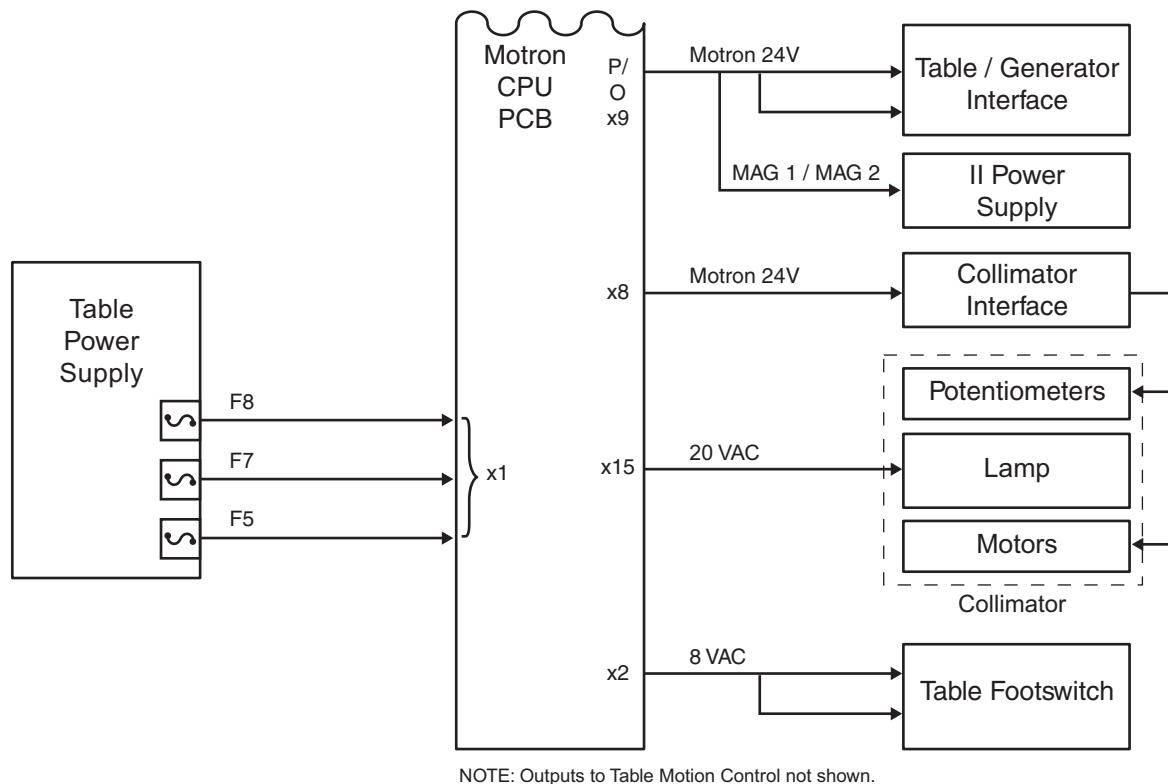
## Power Distribution



**Table Motion Power Distribution**

## Table CPU Power Distribution

In the previous discussion, notice that Table Power Supply outputs of 230 VAC and +24 VDC provide power for table movement. The following figure shows several other power outputs from the Table Power Supply connecting to the Table CPU PCB.



**Table Power Distribution**

## Fault Isolation

**DANGER:** *Normal system shutdown does not remove lethal voltage. When you shut off the workstation, high voltages are present in the backpack on TB3. Never access the backpack interior without first shutting down and locking out CB1 in the main facility power junction box.*

Failure	Possible Cause
Workstation power off	Emergency Off switch in main facility power junction box or another remote switch off. Switches are in series, more than one switch off. Emergency Off circuitry in main facility power junction box defective.
	Blown fuse (1-phase system), defective contactors in main facility power junction box.
	Tripped or defective CB2 in Backpack.
	Workstation internal fault. See Workstation service manual.
X-Ray generation and table motion both inoperative with workstation running. Imaging ok.	Tripped or defective CB1 in Backpack
	In backpack, blown fuse F2 or defective contacts or coil in relay K2.
	Loss of Key Power voltage from workstation.
Table motion and imaging both inoperative when workstation shut off.	In backpack blown fuse F1, SW1 open or defective.
Table motion inoperative, imaging ok.	Fast Stop switch engaged. Tripped or defective table main contactor F1
	Blown fuses F2, F3, F4, F5, or F6 on table power supply
	Defective 230 VAC inverters on table power supply.

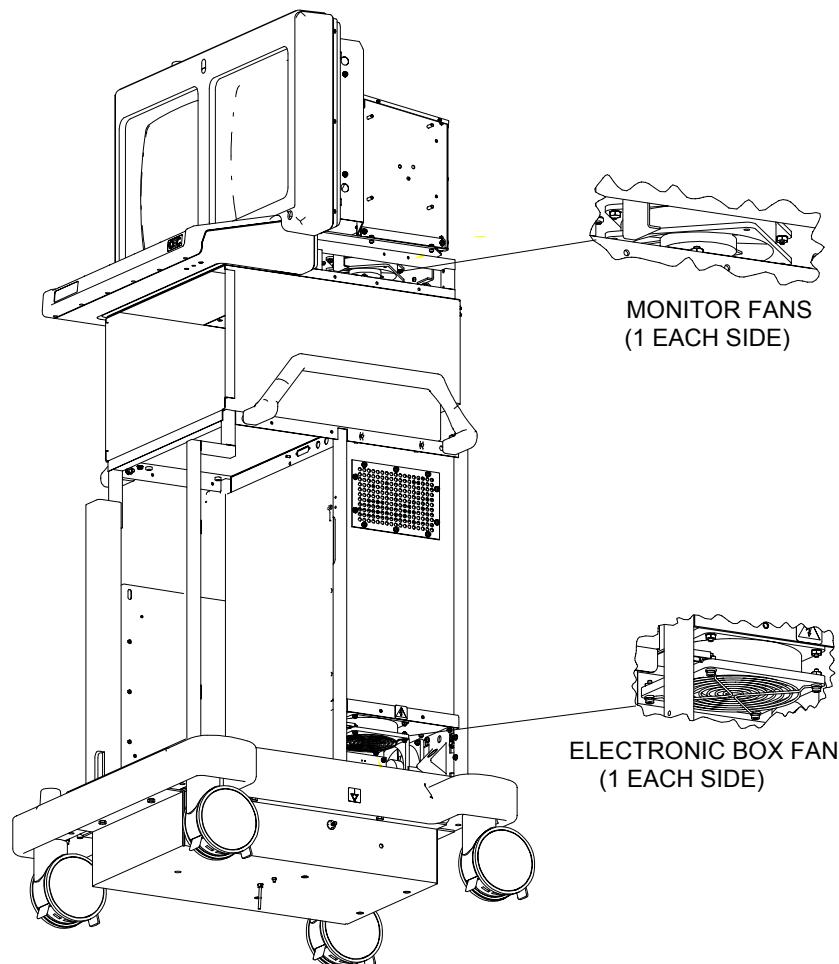
## Power Distribution

<b>Failure</b>	<b>Possible Cause</b>
	Defective relay K3 in backpack.
	Defective main transformer T1 in tower.
Imaging inoperative, table motion ok.	Defective relay K1 in backpack.
X-Ray generation inoperative, table motion inoperative except with foot switch; imaging ok.	In backpack, defective contacts or coil of relay K4.
	Loss of Key Power in Workstation.
	On generator top plate, blown fuse; defective main contactor.
	Blown fuse F13, F16, or F1 on Power Distribution PCB
Flat panel monitor lights, but no image.	Blown fuse F15, F18, or F1 on Power Distribution PCB.
	Faulty video standards converter
	Flat panel monitor defective
X-Ray generation inoperative, <u>and</u> Flat panel monitor lights, but no image. Table motion ok only with foot switch.	Blown fuse F5 on Power Distribution PCB
CCD camera inoperative	Blown fuse F7, F8, F9, or F10 on Power Distribution PCB; defective power supply PS2; defective camera.
Image Intensifier inoperative	Blown fuse F6 on Power Distribution PCB; defective power supply PS2; defective II.
No collimator light	In table power supply, blown fuse F8; defective light.

## **Functional Tests**

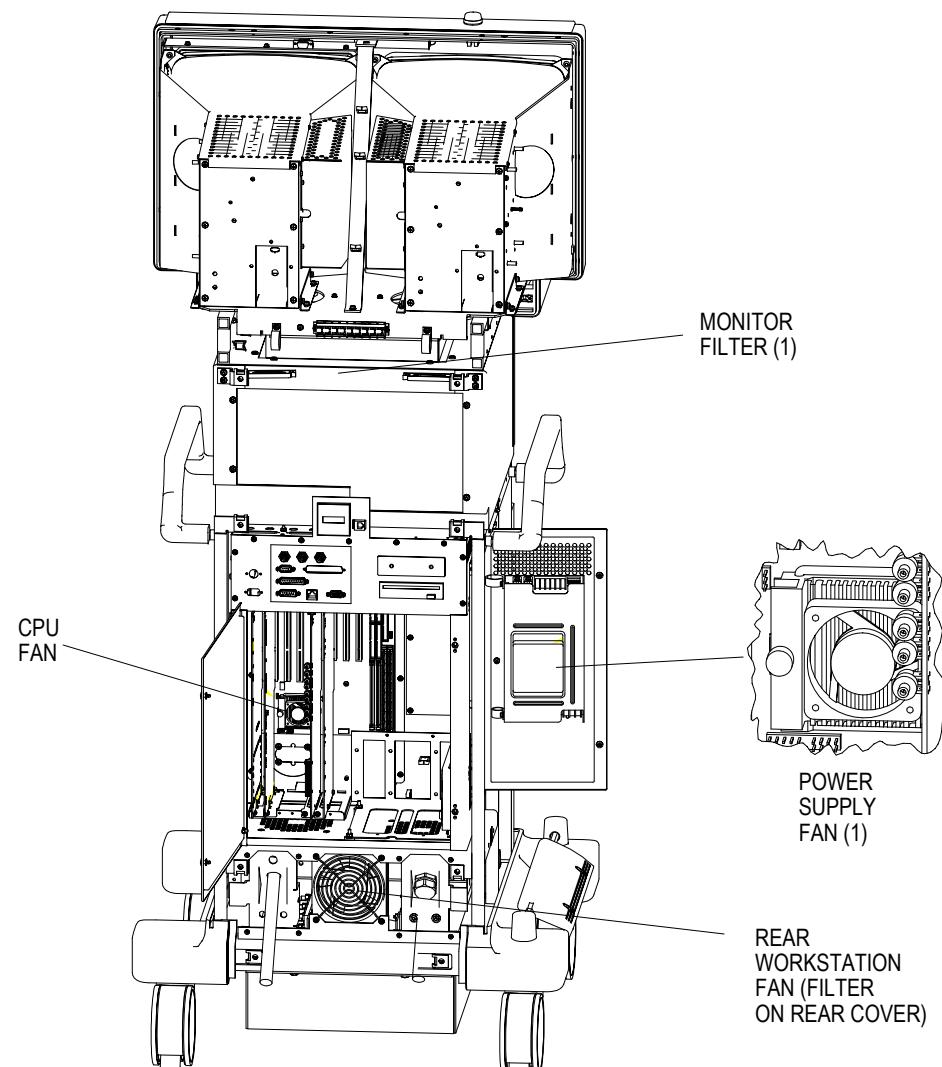
1. Make operating power available to the system as follows:
  - A. In the facility power junction box, turn on all circuit breakers.
  - B. In the backpack, verify that CB1 and CB2 are in the ON position.
  - C. In the tower, place the F1 circuit breaker in the ON position.
2. Place the workstation power switch in the ON position. Verify that the workstation completes software boot and initialization with no errors reported on the displays.
3. Verify that the two VFDs are lighted, and display no error messages.
4. Verify that the workstation and tower elapsed time meters are functional.
5. Verify that the cooling fans are operating on the workstation, tower/table, and generator (see the following illustrations).

## Power Distribution



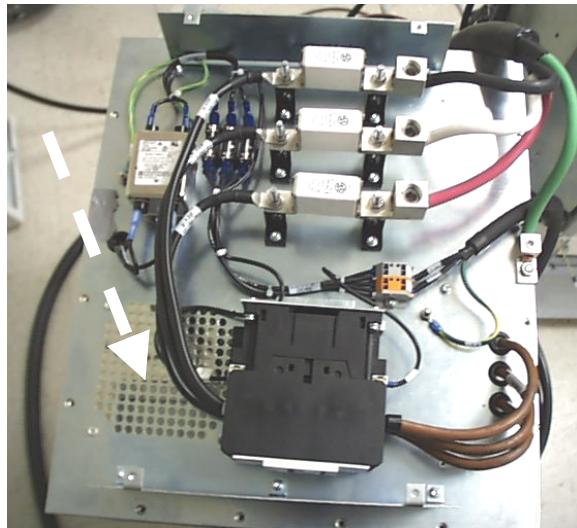
Workstation Fans (View 1 of 2)

## Power Distribution



**Workstation Fans (view 2 of 2)**

## Power Distribution

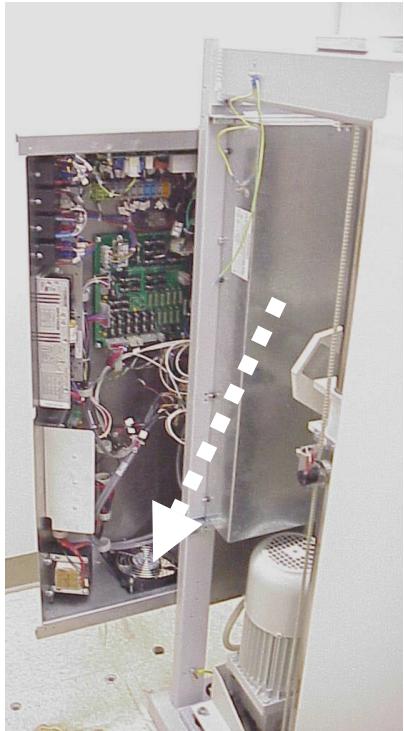


Upper Generator Fan



Lower Generator Fan

## Power Distribution



**Backpack and X-ray tube fans**

## **Power Distribution**

6. Verify operation of the table motion switches.
7. Turn OFF the workstation power switch. Place SW1 (located at tower rear) in the OFF position. Verify the following:
  - A. X-ray generation is disabled
  - B. Table motion is disabled.
  - C. VFD and flat panel display do not light up.
8. With the workstation power switch in the OFF position, place SW1 in the ON position. Verify the following:
  - A. X-ray generation is disabled
  - B. Table motion is operational.
  - C. VFD and flat panel display light up.
9. Place the workstation power switch in the ON position. Press and hold a FAST STOP switch while verifying that table motion is disabled, then release the FAST STOP switch and verify that X-ray generation is disabled and the message FAST STOP BUTTON PRESSED – UNLOCK THE BUTTON TO CONTINUE is displayed on the VFD displays. Reboot the system by placing the workstation power switch in the OFF position for five seconds and then back to ON.
10. Verify the ambient light sensor works by covering it and verifying that the monitor dims.

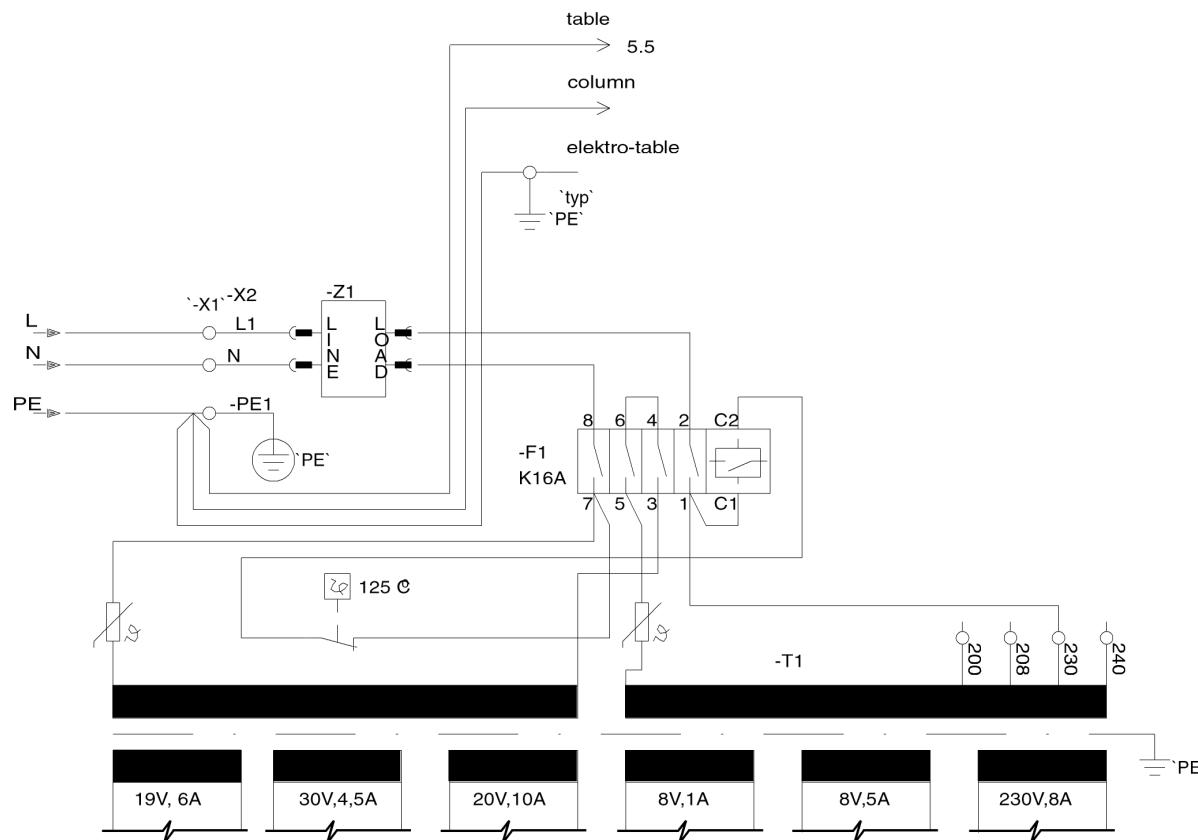
## **Adjustment**

### **Tower/Table Power Supply strapping**



T1 terminal block  
connections

## Power Distribution



<b>Tower Main Transformer Strapping</b>		
<b>Input Voltage</b>	<b>F1 Terminal Block Connection</b>	<b>T1 Terminal Block Connection</b>
240	4-6	240
230	4-6	230
208	4-6	208
200	4-6	200
115	2-4 and 6-8	230

## Miscellaneous

(Not applicable)